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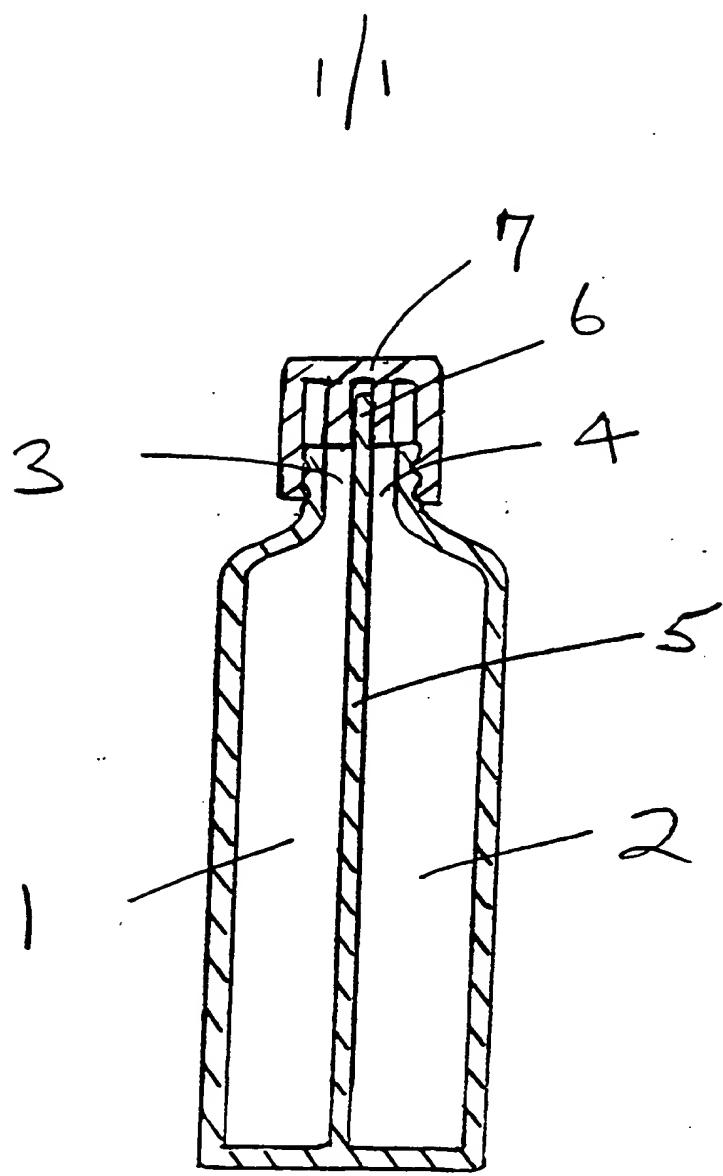
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(71) Applicant(s) <b>Reckitt &amp; Colman Products Limited</b> (Incorporated in the United Kingdom) One Burlington Lane, LONDON, W4 2RW, United Kingdom	(56) Documents Cited GB 2164560 A GB 2086953 A EP 0013043 A1 US 4605534 A
(72) Inventor(s) Neale Harrison Rodney Thomas Fox Philip William Goreham Simon Thacker	(58) Field of Search UK CL (Edition P ) A5E ET INT CL <sup>6</sup> A01N 25/00 Online:WPI
(74) Agent and/or Address for Service <b>Reckitt &amp; Colman plc</b> Group Patents Department, Danson Lane, HULL, HU8 7DS, United Kingdom	
(54) Abstract Title <b>Disinfectants exhibiting colour change</b>	
(57) The invention provides a system for disinfecting a germ carrying body which system comprises two components wherein the first component comprises a disinfectant precursor and the second component comprises a compound which, on admixture with the first component, reacts with the precursor to form a disinfectant; wherein either component includes a substance which exhibits a colour change after a period of time has elapsed, subsequent to the application of the material to the body, which is at least as long as the time required for the material to disinfect the body.	

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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Improvements in or relating to disinfecting materials

This invention relates to disinfecting materials and more particularly, but not exclusively, is concerned with toilet cleaners for disinfecting toilet bowls and  
5 the like.

Toilet cleaners are purchased by customers with a view to killing germs in the toilet bowl and also removing limescale and other stains. Typically,  
10 conventional toilet cleaners are based on sodium hypochlorite or hydrochloric acid and, although these are effective germ killers, they do not provide any indication that germs have been killed and hence the customers cannot readily perceive that the cleaners have fulfilled their purpose in this respect.  
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It is an object of the present invention to provide a material which will disinfect toilet bowls and other bodies whilst also providing an indication that it has carried out its germ killing function.

20 According to the present invention there is provided a system for disinfecting a germ carrying body which system comprises two components wherein the first component comprises a disinfectant precursor and

25 the second component comprises a compound which, on admixture with the first component, reacts with the precursor to form a disinfectant;

wherein either component includes a substance which exhibits a colour change after a period of time has elapsed, subsequent to the application of the material  
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to the body, which is at least as long as the time required for the material to disinfect the body.

5 Preferably, the substance exhibiting the colour change is a bleachable dye, particularly a dye which is bleachable by the disinfectant. The substance is preferably present in admixture with the first component.

10 Preferably the first component comprises the precursor in an amount of from 0.001 to 20 %, more preferably from 0.01 to 5 %, most preferably from 0.1 to 1 % by weight of the first component; the second component comprises the compound in an amount of from 0.001 to 20 %, more preferably from 0.01 to 5 %, most preferably from 0.05 to 1 %, by volume of the second component; and one or more of the components comprises the substance in an amount of from 0.0001 to 2 %, more preferably from 0.001 to 0.5 %, most preferably from 0.01 to 0.1 %, by weight of the component(s) in which the substance is present.

15 20 Preferably each component is in the form of an aqueous solution. Optionally each component additionally comprises additives such as stabilisers, buffers, preservatives, viscosity modifiers, perfumes and/or surfactants.

25 Suitable dyes are as follows:-  
C.I. Acid Blue 182, such as Sandolan Blue E-HRL supplied by Clariant;

30 C.I. Acid Blue 80, an anthraquinone dyestuff, such as Sandolan Milling Blue N-BL;

C.I. Reactive Blue 113, such as Drimarene Blue K3GL supplied by Clariant;

C.I. Reactive Blue 114 such as Drimarene Brilliant Blue K-BL;

Azo/copper complex dyestuffs such as Cartasol Blue 5 GDF supplied by Clariant;

Anionic azo-dyes such as Cartasol Brilliant Violet 5BF.

A suitable bleaching agent which is formable from 10 the two components is chlorine dioxide. In this case, a suitable precursor is an alkali metal chlorite, preferably sodium chlorite which, when admixed with an acid such as hydrochloric acid, sulphamic acid or citric acid (preferably hydrochloric acid is used), generates the chlorine dioxide.

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According to a preferred embodiment of the invention the system is in the form of a container comprising:

a first compartment for said first component,

a second compartment for said second component,

20 a first outlet for egress of a stream of first component from said first compartment, and

a second outlet for egress of a stream of said second component from said second compartment, said outlets being arranged such that the streams impinge on one another and the first and second components become 25 admixed together when the components are poured from the container.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the 30 accompanying drawing which shows a schematic cross

section through a container in accordance with the invention.

Referring to the drawing, the container is a double container comprising a first compartment 1 and a second compartment 2. The compartments 1 and 2 have separate outlets 3 and 4 at the neck of the container and the container includes a common dividing wall 5 which extends beyond the outlets 3 and 4 to form a baffle 6. Both outlets 3 and 4 are sealed by a cap 7 threadingly connected to the neck of the container. Separate first and second components are accommodated in the first and second compartments 1 and 2 and are retained by the cap 7.

In use, the cap 7 is unscrewed and the container is tilted so that a stream of the first component leaves the first compartment 1 via the first outlet 3 and a stream of the second component leaves the second compartment 2 via the second outlet 4. The baffle 6 assists in causing these streams to intermingle and form a single stream of the mixed components.

The following Example illustrates the invention.

Example

A first component comprising an aqueous solution of sodium chlorite in an amount of 1% by weight of the first component and sufficient (0.02 % by weight) of the blue dye C.I. Acid Blue 182 to provide the first component with a blue colour was introduced into the first compartment 1 of a container as shown in the drawing. A second component comprising an aqueous colourless solution of hydrochloric acid in an amount

of 1% by volume of the second component was introduced into the second compartment 2 of the container.

On pouring some (about 20 ml which consisted of about 10 ml of each component) of the contents from the container into a toilet bowl, the streams of the first and second components intermingled to form a blue mixture prior to reaching the toilet bowl. The mixture reacted to form chlorine dioxide ( $\text{ClO}_2$ ). This is an efficient germ killer and within 10 minutes it had disinfected the toilet bowl. It is known from microbiological tests that 10 minutes is a sufficient period of time for this amount of  $\text{ClO}_2$  to disinfect a toilet bowl.

Within 15 minutes of the mixing together of the first and second components, the blue mixture had become colourless as the chlorine dioxide had completely bleached the blue dye. Thus the user could readily perceive that the material had killed the germs\* in the toilet bowl.

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CLAIMS

1. A system for disinfecting a germ carrying body which system comprises two components wherein  
5 the first component comprises a disinfectant precursor and

the second component comprises a compound which, on admixture with the first component, reacts with the precursor to form a disinfectant;

10 wherein either component includes a substance which exhibits a colour change after a period of time has elapsed, subsequent to the application of the material to the body, which is at least as long as the time required for the material to disinfect the body.

15 2. A system according to claim 1 wherein said substance is a dye bleachable by the disinfectant.

20 3. A system according to claim 1 or claim 2 wherein the first component comprises the precursor in an amount of from 0.001 to 20 % by weight of the first component, the second component comprises the compound in an amount of from 0.001 to 20 % by volume of the second component and one or more of the components comprises the substance in an amount of from 0.0001 to 2 %, by weight of the component(s) in which the substance is present.

25 4. A system according to any one of the preceding claims wherein the precursor is an alkali metal chlorite, the compound is an acid, the disinfectant is chlorine dioxide, the substance is a bleachable dye which is in admixture with the first component, and 30 each component is in the form of an aqueous solution.

5. A system according to any one of the preceding claims which is in the form of a container comprising:

a first compartment for said first component,

5 a second compartment for said second component,

a first outlet for egress of a stream of first component from said first compartment, and

10 a second outlet for egress of a stream of said second component from said second compartment, said outlets being arranged such that the streams impinge on one another and the first and second components become admixed together when the components are poured from the container.

15 6. A container according to claim 5 substantially as hereinbefore described in the accompanying drawing.

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Claims searched: 1 at least

Examiner: Peter Davey  
Date of search: 9 September 1998

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.P): A5E (ET)

Int CI (Ed.6): A01N 25/00

Other: Online: WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2164560 A (JEYES), see eg. claim 1 and page 1, lines 28-31	1 at least
X	GB 2086953 A (PROCTER & GAMBLE), see eg. claim 7	-
X	EP 0013043 A (PROCTER & GAMBLE), see eg. claim 1 and page 2, lines 26-29	-
X	US 4605534 (TWINOAK), see eg. claim 1	-

- X Document indicating lack of novelty or inventive step  
Y Document indicating lack of inventive step if combined with one or more other documents of same category.  
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- A Document indicating technological background and/or state of the art.  
P Document published on or after the declared priority date but before the filing date of this invention.  
E Patent document published on or after, but with priority date earlier than, the filing date of this application.